ANÁLISE DO PERFIL EPIDEMIOLÓGICO E MORBIMORTALIDADE DE HOMENS ATENDIDOS COM PANCREATITE AGUDA EM REGIME DE URGÊNCIA NO NORTE DE MINAS

Analysis of the epidemiological profile of men treated with acute pancreatitis in urgent regime in north of Minas

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Abstract: Introduction: Acute pancreatitis is one of the most common inflammatory processes of the gastrointestinal tract, making a major impact on patients' lives. Its main causes are gallbladder stones and alcohol. **Objectives:** to analyze the epidemiological and morbimortality profile of acute pancreatitis in men treated as an emergency in the North of Minas Gerais. **Methodology:** epidemiological, descriptive and quantitative research in patients with acute pancreatitis in men treated as an emergency in the health services of the North of Minas Gerais during the period from 2008 to 2017. Data were obtained from the Hospital Information System of the SUS. **Results:** There was an increase in the number of hospitalizations between 2009 and 2016, with a higher frequency between 30 and 39 years (n = 683) and brown (n = 1078). The highest number of deaths between 30 and 39 years (n = 33). There were more hospitalizations in the public sector (n = 942) than in the private sector (n = 891). Spending was higher in the private sector. Regarding the average length of stay, there was an overall average of 6.4 days in the public sector and 5.6 days in the private sector. The mortality rate remains approximately constant in the age groups from 20 to 29 years (3.93%), 30 to 39 years (4.8%) and 40 to 49 years (5.3%). **Conclusion:** AP is a serious disease that, if not promptly diagnosed and treated, has a tragic outcome. In this context, studies like this are important to serve as a basis for health authorities in decision-making and make the best resources used.

Keywords: Pancreatitis; Mortality; Epidemiological profile.

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Análise do perfil epidemiológico e morbimortalidade de homens atendidos com pancreatite aguda em regime de urgência no norte de minas

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Resumo: Introdução: A pancreatite aguda é um dos processos inflamatórios mais comuns do trato gastrointestinal, constituindo um grande impacto na vida dos pacientes. Suas principais causas são cálculo biliar e abuso de álcool. **Objetivos:** analisar o perfil epidemiológico e de morbimortalidade da pancreatite aguda em homens atendidos em caráter de urgência no Norte de Minas. **Metodologia:** investigação de caráter epidemiológico, descritivo, e quantitativo em portadores de pancreatite aguda em homens atendidos em caráter de urgência nos serviços de saúde do Norte de Minas, durante o período de 2008 a 2017. Os dados foram obtidos do Sistema de Informações Hospitalares do SUS. **Resultados:** Ocorreu um aumento do número de internações entre 2009 a 2016 com maior frequência entre 30 e 39 anos (n=683) e na raça parda (n=1078). Maior número de óbitos entre 30 e 39 anos (n=33). Ocorreram mais internações no setor público (n=942), do que no privado (n=891). Os gastos foram maiores no setor privado. Acerca da média de permanência, houve média geral de 6,4 dias no setor público e 5,6 dias no setor privado. A taxa de mortalidade se mantém aproximadamente constante nas faixas etárias de 20 a 29 anos (3,93%), 30 a 39 anos (4,8%) e 40 a 49 anos (5,3%). **Conclusão:** A PA é uma doença grave que, se não for prontamente diagnosticada e tratada, possui um desfecho trágico. Nesse contexto, estudos como esse são importantes para servir como base para as autoridades de saúde na tomada de decisões e tornar os recursos melhores aproveitados.

Palavras-chave: Pancreatite; Mortalidade; Perfil epidemiológico.

INTRODUCTION

For nearly a century has been given great attention to understanding the pathophysiology, diagnosis, classification and treatment of acute pancreatitis (AP). Of course, during this period, great advances were obtained based on clinical observations, experimental studies and the creation of new resources for research. This has resulted in a better understanding of the disease, with consequent reduction in the rates of mortality.[1]

AP is one of the most common diseases of the gastrointestinal tract, leading to a terrible emotional, physical and financial human burden .[2] The disease incidence varies geographically and depends, above all, on the cause, ranging between 4.8 and 24.2 patients per 100000 individuals.[3] According to Rockenbach[3], excluding the Asian countries, where the parasites of the biliary tree constitute an important cause, about 80% of the patients of pancreatitis have as a cause the biliary lithiasis and alcohol, 10% result from different causes and about 10% remain of unknown cause.

In this context, AP is defined as an inflammatory process where the self-digestion occurs because of uncontrolled activation of trypsin with resulting activation of zymogen in the pancreas.[4-6] It is, in the majority of cases, an inflammatory disease, self-limited and resolved with clinical measures. However, the presence of pancreatic and peripancreatic necrosis, associated to infection, is potentially severe and may require care and specialized approaches. [7]

The AP etiology can be readily established in most patients.[8] Their most common causes are stones in the gallbladder (40-70%) and alcohol (25-35%), according to Lankish *et al.*[9], Provincia *et al.*[10] and Lowenfels, Maisoneuve and Sullivan.[11] Being that AP induced by alcohol often manifests as a spectrum ranging from discrete episodes until silent chronic irreversible changes.[8] Other causes of AP include: medications, infectious agents and metabolic causes such as hypercalcemia and hyperparathyroidism[12-14]; hypertriglyceridemia, primary or secondary in 1-4% of cases[14]; and pancreatobilliary tumors benign or malignant in 5-14% of cases as the adenocarcinoma of pancreas[15-17]. In addition, there is the idiopathic AP, which can be defined as without etiology established after the initial evaluation laboratory (calcium levels

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and lipid) and image tests (transabdominal ultrasound and computed tomography (CT).[18]

The AP diagnosis requires at least two of the following three criteria: (1) beginning with abdominal pain, persistent and severe radiating to the dorsum; (2) serum lipase activity (or amylase) at least three times above the upper limit of normal; and (3) characteristic findings of AP in computed tomography with enhanced contrast (CEPT) and less commonly magnetic resonance imaging (MRI) or transabdominal ultrasound.[19-23] In addition, AP can be divided into two types: interstitial edematous pancreatitis and necrotizing Pancreatitis; and has two phases: early (duration of up to 1 week) and late (lasting from weeks to months).[24]

In this context, considering that AP is a condition that requires early diagnosis and immediate intervention, because it is a medical emergency, this work had as objective to analyze the epidemiological profile and morbidity and mortality of acute pancreatitis in men serviced in urgency character in Northern Minas.

METHODOLOGY

This was a descriptive epidemiological, cross-sectional study, with a quantitative approach. The data collection technique used was the documentary consultation on DATASUS database, which contains health information systems available via the Internet at website http://www.datasus.gov.br. The data on hospital morbidity of the Unified Health System (SUS) by place of hospitalization for acute pancreatitis in men in the emergency services were originating from the Hospital Information System (SIH/SUS), which uses as instrument the form of Authorization for Hospitalization (AIH). The data collection occurred in the month of May 2018 through the use of the TABNET program. The study population consisted of all cases of men with acute pancreatitis treated in emergency regime in the northern region of Minas Gerais in the period from 2008 to 2017. The tabulation of records of SIH/SUS for the research included the following variables: age,

sex, year of hospitalization, race, character, expenditures, deaths and mortality rate. The data were organized in spreadsheets of the software Microsoft Excel® and passed through a descriptive statistical treatment, being calculated the prevalence, mortality rate and number of hospitalizations for acute pancreatitis and presented in the form of graphs. Bearing in mind that the survey was based on data available in electronic form by the Ministry of Health, these being in the public domain, and by the fact that there as confidentiality of personally identifiable information inherent to human beings involved, this study eliminates the consideration and approval by the Committee for Ethics in Research.

RESULTS

In the period from 2008 to 2017 2483 cases of acute pancreatitis were recorded in males, as a matter of urgency, in the northern region of Minas Gerais. In the year 2008 to the year 2009, there was a reduction of 9.2%. The figure makes an ascending curve from the year of 2009 that represented the lowest percentage of notifications 6.8% of the total, with an increase of 94% in the number of admissions until 2017. The year of 2016 presented the greatest percentage of cases reported 13.1%, from this year, the number of cases reduced in 15% (2017). It was observed an increasing trend over the period examined, with an average of 248 cases, approximately

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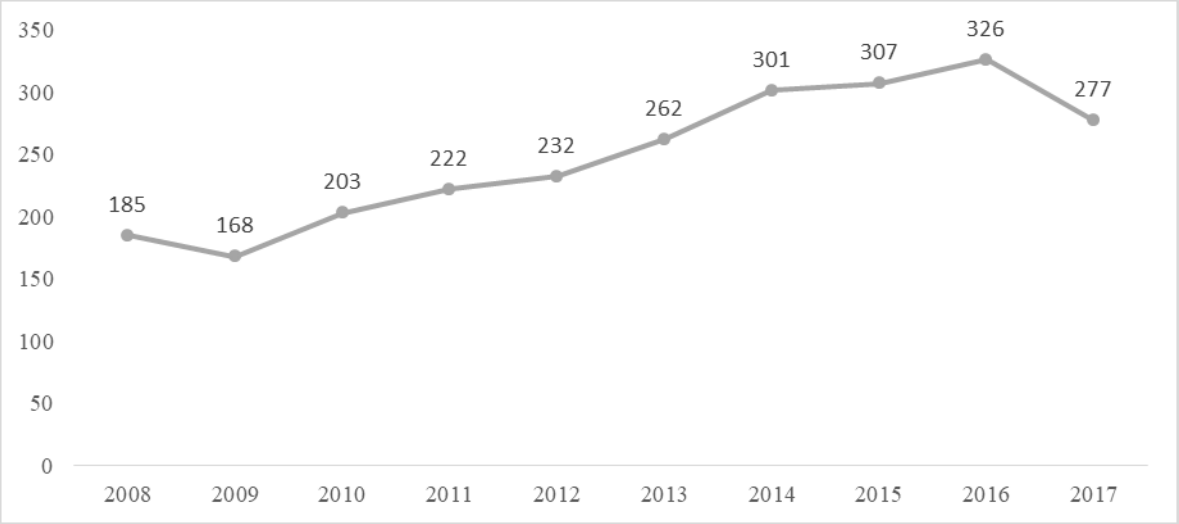
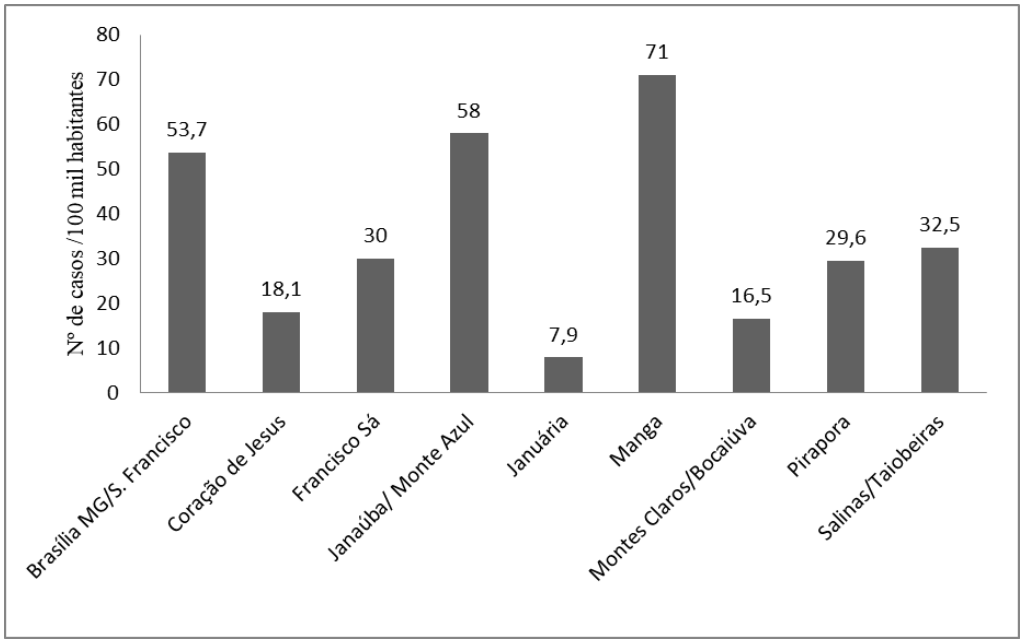
Figure 1: number of hospitalizations for acute pancreatitis in men in the North of Minas, 2008 to 2017



Source: Ministry of Health - Hospital Information System of SUS (SIH/SUS)

Upon analyzing the prevalence of this disease by region of health, it was observed an average record of approximately 27.2 cases per 100,000 inhabitants. The region with the highest prevalence of hospitalizations was manga (71 cases), and the lowest prevalence was Januária (7.9 cases),

Figure 2: Mean Prevalence of hospitalizations for acute pancreatitis in men in the North of Minas, 2008 to 2017



Source: Ministry of Health - Hospital Information System of SUS (SIH/SUS**)**

According to the demographic data of the Hospital Information System of SUS (SIH/SUS), it was observed that the majority of the cases was mostly distributed from 20 to 69 years (91.91%), being that in patients with 19 years and/or unless there is a total of 33 cases (1.3%) and in patients with more than 70 years there as 187 cases (7.5%) registered in the period analyzed. Being the most affected age ranges from 30 to 39 years (27.5%). In this range, the health regions (RS) of Montes Claros/Bocaiúva and Januaria/Monte Azul concentrate the majority of cases of acute pancreatitis (27.1% and 24.9%, respectively).

In relation to the most affected race/ethnicity, a higher prevalence of acute pancreatitis was observed in brown ones (43.4%). Furthermore, it should be noted that 49.1% of the patients surveyed did not declare race.

Regarding the number of hospitalizations by admission regime, 37.9% were in public hospitals and in 35.9% of the cases were in private hospitals. In addition, it is noted that the highest rates of hospitalization, respectively, in the RS of Montes Claros/Bocaiuva (29.7% being 30.4% public), Janaúba/Monte Azul (21.8% being 41.5% public) and Brasília de Minas/São Francisco (19% being

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70.3% public). Finally, the mean number of hospital admissions in the public sector was approximately 94 cases and for the private sector was 89 cases.

In the period from 2008 to 2017, in the total was spent more with the private sector (72.1%) than with the public sector. In addition, it was possible to observe that was spent on average $45,967.43 with the public sector and R$72,790.81 with the private sector.

Regarding the average length of stay in the public or private sector, it should be noted an overall average of 6 days in the public sector and 5 days in the private sector. Being that RS of Montes Claros/Bocaipuva had the highest stay averages (9 days in the public sector and 7 days in the private sector. Whereas the lowest stay was in the regions of Francisco Sá (5 days in the public sector) and Manga (4 days in the private sector)

Table 1: Sociodemographic and clinical data of hospitalizations for acute pancreatitis in regime of urgency in men in the North of Minas in the period from 2008 to 2017

	BAM/SAF	COJ	FRS	JAN/MAZ	JAR	MAN	MOC/BO	SAN/TAI	PIR	Total
Age range:										
0 to 9										
10 to 19	1	-	-	3	-	-	1	-	-	05
20 to 29	5	-	3	8	-	1	8	1	2	28
30 to 39	74	3	19	75	9	17	106	38	12	353
40 to 49	123	19	16	170	16	54	186	54	45	683
50 to 59	113	10	14	133	18	26	185	59	41	599
60 to 69	87	7	9	72	5	20	100	40	34	374
Over 70	42	7	12	46	3	15	91	22	16	254
	27	3	5	35	3	8	60	29	17	187

Race:										
White	7	-	2	8	-	16	56	11	3	103
Black	6	-	6	3	-	2	24	5	2	48
Brown	152	-	53	242	3	115	324	146	43	1,078
Yellow	14	-	3	-	-	1	7	-	-	25
Indian	-	-	-	1	1	7	-	-	1	10
Ignored	293	49	14	288	50	-	326	81	118	1,219
Regime:										
Public	332	33	13	225	37	-	224	48	30	942
Private	37	-	29	181	-	120	285	149	90	891
Ignored	103	16	36	136	17	21	228	46	47	650
Stay										
Public	5.2	5.8	5.0	6.3	5.9	-	9.4	2.9	4.9	6.4
Private	4.2	-	4.9	4.3	-	4.1	7.3	6.2	5.2	5.6
Expenditures:										
Public	185,432.88	9,517.63	3,666.44	124,776.98	11,771	-	114,483.18	13,624.89	8,600.68	459,674.26
Private	9,928.14	-	8,128.62	52,053.43	-	32,756.72	371,915.53	190,876.13	62,249.56	727,908.13
Ignored	88,826.61	4,384.18	10,653.68	85,226.48	4,754.4	7,651.85	217,722.24	24,933.63	15,521.18	459,674.26

Legend: BAM/SAF (Brasília de Minas/São Francisco), COJ (Coração de Jesus), FRS (Francisco Sá), JAN/MAZ (Janaúba/ Monte Azul), MOC/BO (Montes Claros/Bocaiuva), SAL/TAI (Salinas/Taiobeiras), JAR (Januária), PIR (Pirapora)

Source: System of Hospital Information of SUS (SIH-SUS)

The total number of deaths by AP in men in the North of Minas in the period from 2008 to 2017 was 150 cases. The year 2009 was the one that presented the lowest number of deaths, suggesting a certain degree of control in the mortality of the disease. However, between 2010 and 2011 there was an increase in the frequency of deaths. The other results are exhibited in

Figure 3: Number of deaths and mortality rate from acute pancreatitis in men according to year of care service in emergency services of the north of Minas, 2008

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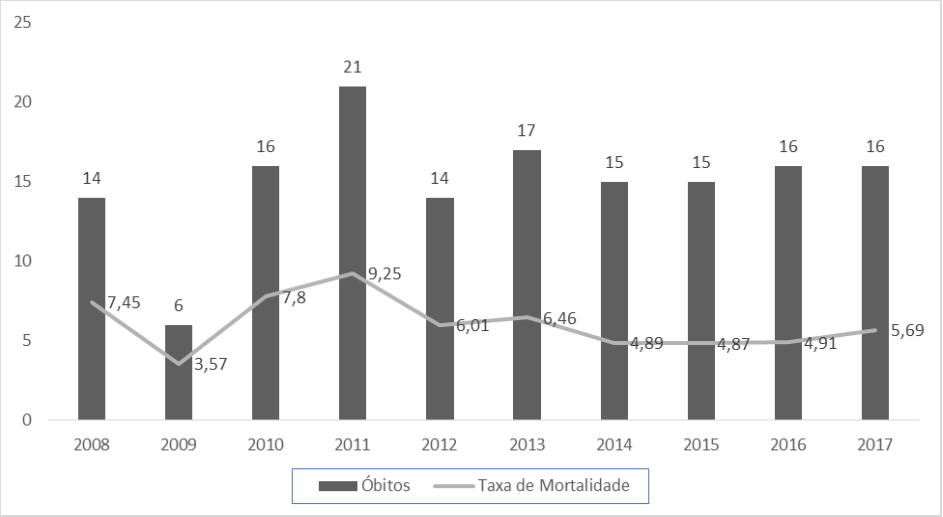
to 2017.

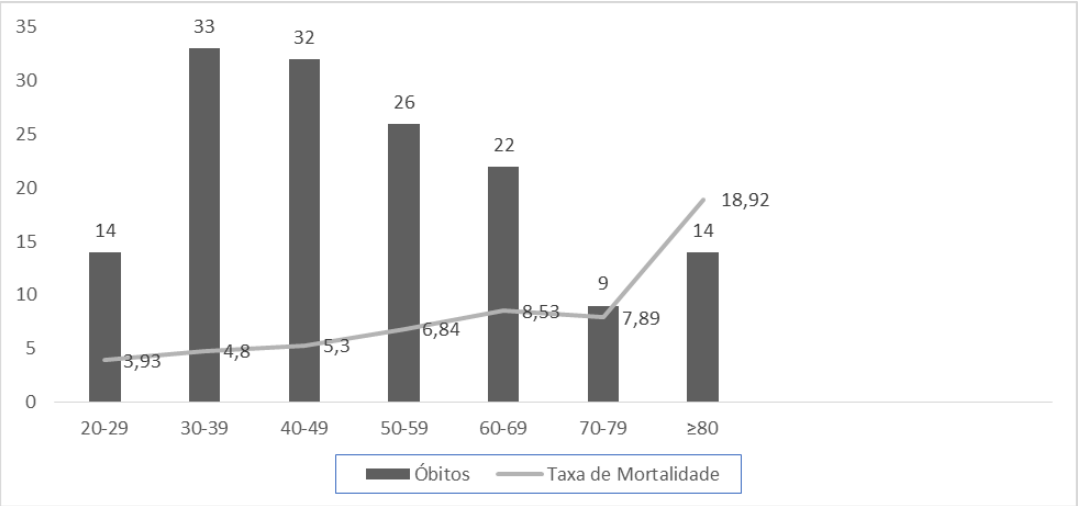
Source: Ministry of Health - Hospital Information System of SUS (SIH/SUS)



The average mortality rate for acute pancreatitis in emergency services from the north of Minas in the period studied was 5.99% and has gradually increased from the age range from 20 to 29 years (3.93%), reaching a peak in patients aged 80 years or more (18.92%). However, there is a certain discrepancy between mortality rate and the number of deaths, because there are significant variations in the number of hospitalizations in each age group. For example, the largest number of deaths occurred among individuals between 30 and 39 years (33 deaths), but the highest mortality rate is among patients aged ≥ 80 years (18.92%)

Figure 4: Number of deaths and mortality rate from acute pancreatitis in men according to age ranges in emergency services of the north of Minas, 2008 to 2017.

Source: Ministry of Health - Hospital Information System of SUS (SIH/SUS)



DISCUSSION

During the period from 2008 to 2017 were notified by the Information System of SUS (DATASUS) in Minas Gerais, 26,574 cases of acute pancreatitis, of these, 9.3% were in Northern Minas behind the regions Center (27.6%) and South (17.8%) of the state. It was observed an increasing trend in the number of hospital admissions over the period examined (94%). Rasslan *et al.*[25] highlights the increase in the incidence of the disease, with elevation of the hospitalizations in 20% in the last ten years, much lower increase than that found in the northern region of Minas Gerais.

The year 2016 was the year with the largest number of hospitalizations in the period studied (326), corroborating with the data from the state of Minas Gerais, which also showed a higher number of hospitalizations in the year 2016 and diverting from Brazil, which presented a greater number of hospital admissions in 2017. However, in the North of Minas Gerais and Brazil the year that had fewer hospitalizations was in 2009, did not coincide with the data of the state that had the lowest number of hospital admissions in 2010.[26]

Acute pancreatitis represents one of the main causes of hospitalization in intensive care units. In spite of its incidence vary in different countries (4.9 to 35 cases per 100 thousand inhabitants), and depend on the etiology, it has recently increased, and it is estimated that in the United States

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reaches 70 hospitalizations/100 thousand people per year.[27-28]

The northern region of the state of Minas Gerais and the municipality of Manga observed an average record of hospitalizations per 100 thousand inhabitants (27.2 and 71), above the rates in the country (7.06) and the state (12.58), but similar estimates of the United States.[26-27]

Thus, the overall incidence and the distribution of cases of the disease in different areas of the world, are much influenced by several factors, mainly by alcohol abuse and biliary lithiasis.[29-30] In addition, there has been an improvement of diagnostic methods leading to greater record of this disease.[31]

Regarding hospitalizations by age, a higher frequency was observed between 30 and 39 years in the municipalities evaluated. Other authors have found a higher number of diseases at the age of 50 years.[32]

As to the northern regions of Minas Gerais, Montes Claros/Bocaiúva, showed a higher prevalence of hospitalized patients, and those with the highest prevalence between 50 and 59 years. This fact can be explained by the size of the cities and the scope of their health systems. Rockenbach *et al.* [3] found a mean age of 49 years, below the values found in this study. Gomes and Lograd[33] conducted a study on the Regional Hospital of Brasília - DF and found the average age of 47.61 years.

Analyzing the data from the ethnic and racial point of view , it was perceived a higher prevalence of hospitalizations by disease among patients of brown complexion in all municipalities of the north of Minas Gerais, different from the results of the research carried out from records in Porto Alegre/RS that found 86.7% of the white race[3]. This difference can be justified by the fact that the South of the country have European ancestry and the north of Minas a mixture of races.

Regarding the scheme used in hospital admissions, there is a considerable balance of data between the public (37.9%) and private (35.9%) regimes, in the emergency services. Relatively common, acute pancreatitis is one of the most frequent conditions for indication of imaging examinations in emergency environment, which are

carried out both in public and in private regimes.[34]

The permanence time of hospitalization in the public system (average of 6.4 days) was longer than in the private services (average of 5.6 days), and the overall average of 6.2 days. However, in another study, the mean hospital stay (12.93 days), was longer than that found in the north of Minas Gerais. The short time of hospitalization may be related to the fact that the patients in the study were patients with mild acute pancreatitis, which usually evolves with clinical improvement in a short period of hospitalization.[3]

Upon analyzing the expenses with hospitalizations for acute pancreatitis in urgency character in men in the region, there has been an average annual expenditure of R$ 165,945,60, these being higher in the private system (72.1%), despite the increased number of hospitalizations having occurred in public regime. In Brazil, around R$ 10,480,470.20 are spent on average per year with the same profile of patient and in Minas Gerais R$ 1,811.558.80. In Brazil, the costs are higher in the public system (39%), in relation to the private sector, diverging from the data found in the present study. However, in the state of Minas Gerais, the expenses with hospitalizations are higher in the private system (49%), corroborating with the northern region of the state.[26]

The majority of patients with acute pancreatitis has a mild form of the disease, which is self-limited and has good evolution with the conservative treatment and lower costs. However, approximately 20-30% of cases evolve to severe forms, with significant morbidity and mortality, requiring more specialized services and consequently higher costs.[34]

According to Da Silva Brito *et al.*[35], the mortality rate in 2014 in Brazil by acute pancreatitis was around 5.69%. Research carried out at Hospital of Sorocaba revealed similar results[32], which corroborates with the results of this study presented in figure 2. In contrast, research conducted in individuals with acute pancreatitis in a hospital of Fortaleza showed a mortality rate of 8.6%, higher values than this research.[36]

The suspension of alcohol and/or drugs ingestion, the correction of hypertriglyceridemia, replacement of fluids intravenously has contributed to the reduction of mortality.[37]

To Ferreira *et al.*[38], obesity is one of the most important negative prognostic factors and suggested that it

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increases the risk for both local and systemic complications.[36]

The most common etiology of acute pancreatitis was the abuse of alcohol, followed by cholelithiasis and comorbidities such as arterial hypertension, dyslipidemia, diabetes type II. These factors explain the mortality rate, being that the abovementioned comorbidities have their prevalence in ascension.[39]

Advanced age is a factor of worse prognosis in the evolution of the disease, since there is an increase of comorbidities as time passes by. [36] This has been observed in the analyzes herein, which showed a rise in the rate of mortality in relation to age. Other authors also corroborate with this result to show that the mortality in patients older than 70 years (21.4%) was greater than patients with less than 70 years (7.1%)[40]. It is, therefore, realized that aging is associated with increased morbidity, implying that an increase in age should be an important variable in the prognosis of patients with acute pancreatitis.[11]

A limitation of this study was the data analysis, since the study of data through the Hospital Information System of the Unified Health System will not allow to make more detailed analyzes of the variables studied, limiting only the description of the same, without investigation of other risk factors and their influence on the diagnosis and prognosis of the disease.

CONCLUSION

AP is a serious disease that, if not promptly diagnosed and treated, has a tragic outcome. Although, over the last ten years, there has been an increase in the number of cases, the mortality rate of the disease showed a decline, which may be related to a greater dissemination of the disease in the medical environment and leading to an early diagnosis. It is possible to see a discrepancy, to the extent that there were more hospitalizations in the public sector, but the expenses with hospitalizations in the private sector were higher. In addition, there is an increase in the mortality of the disease with age progression.

Given this scenario, it becomes essential to know about the preventive

actions directed toward the control of risk factors (obesity, hypertriglyceridemia, Type II Diabetes mellitus, alcohol abuse) and the early diagnosis in order to decrease the number of hospitalizations and deaths.

There is no conflict of interests.

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